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A Chiometer for Towed Bodies and a New Winch for SWIMS3

Michael C. Gregg
Applied Physics Laboratory, University of Washington
1013 NE 40th St.
Seattle, WA 98105-6698
Phone: 206-543-1353 (Gregg), 206-543-1346
Fax: 206-543-6785
Email: gregg@apl.washington.edu, miller@apl.washington.edu

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LONG-TERM GOALS

Our goal is to understand mixing in shallow water, i.e., the upper 500 to 1000 m, by observing it in relation to the larger-scale processes producing it. Regimes of interest include open-ocean fronts, continental slopes and shelves, ridges and canyons.

OBJECTIVES

This project will add a chiometer to SWIMS3, our depth-cycling towed body, to observe scalar microstructure in addition to the larger-scale variables currently measured. It will also replace the winch used to cycle SWIMS3 in depth.

APPROACH

Owing to its faster speed and tighter profiles, SWIMS3 can sample mixing processes much more intensively than can microstructure profilers. We have been estimating dissipation rates using Ozmidov scaling of density overturns. Adding the Chiometer will provide a more direct measure by adding the variance of small-scale scalar gradients to the data suite.

The new winch is needed simply to replace the present one, which we have used since 1993. Because it will carry a longer and thicker tow line, it will let us profile deeper and reduce the chance of losing SWIM3 by cable failure.

WORK COMPLETED

Lee and Gobat mounted the Chiometer on Triaxus for Philex09, but the probes were destroyed during their first run when the towed body hit a submerged object. Fortunately, the electronic case was not affected, and the Chiometer will be ready for them to use in the western Pacific during 2010.

Sound Ocean Systems, the company making the new SWIMS winch blew the design and could not deliver the winch when expected last winter. After much consultation with our engineering staff and redesign, SOS has scheduled a final acceptance test for October 26, 2009.

RESULTS

No significant results have been obtained yet.